

# Zn2 Toolkit Version 1.0 Guide

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## Overview

The Zn2 Toolkit includes four different tools needed to run a  $Z_n^2$  statistic on a dataset. A general description is provided for each tool. When selecting the desired tool using the search the tool name should be entered as is is presented, or in all lowercase. This same general description is also available when the toolkit starts up.

Converter - Converts .lc file to .csv file readable by the Zn2 tools

CPU Zn2 - Zn2 statistic that runs on the CPU (Works for all builds)

GPU Zn2 - Zn2 statistic the runs on the GPU (Only works with CUDA devices i.e Nvidia GPUs)

Combos - Combines all files for a data set, plots, and allows search for numerical results

If a tool is not entered correctly or a tool isn't selected the program will close.

## Directions to Run a $Z_n^2$ Statistic

### Prerequisites

Before using the Zn2 Toolkit the only thing required is a lightcurve file (.lc).

### Step 1: Conversion

Launch the Zn2 Toolkit and enter "converter" into the search line. You will be prompted to enter the path to the lightcurve file you want converted. Then you will be prompted to enter the path to the output directory where the .csv file will be saved. Last you will need to name the output .csv file. Do not include .csv at the end of the name. The converter tool will be used to convert the lightcurve file to much easier to read .csv file. This is the most important step as the other tools can only read .csv files.

## Step 2: Run the Statistic

Now we can run the statistic on the .csv file that we generated. Select either the CPU or GPU Zn2 tool and run through the prompts. The GPU version is only compatible with CUDA devices, or in other words Nvidia graphics cards. The GPU version runs noticeably faster for large data sets, depending on the hardware. The CPU version is compatible with all devices, and runs slightly slower. The progress bar will show the number of iterations taking place, time elapsed, estimated time remaining, and time per iteration. If the input data set is too large it will be broken up into chunks and as a result the output will come in multiple files of each chunk. BE AWARE... It is normal for a large data set to break into 10+ chunks. Save the paths to these output files as they are needed for the final step.

## Step 3: Combining, Plotting and Searching

Launch the combos tool, and enter the amount of output files that were produced. Then enter the paths to each of these files. Only enter one path at a time, as you will be prompted to enter output file 1,2,3... You also have the option to enter a title for your plot, scale the results of the statistic, determine the x - axis tick mark spacing, and search for numerical results. You can search the numerical results for a specific value or a range of values. You can also opt to save the numerical results, which is highly recommended.

## Final Notes

As stated before if something is entered incorrectly, or not entered in the toolkit is coded to close. This hopefully changed in future versions. There is not yet a tool to apply the orbital corrections, that will be added in future versions. If you encounter any other bugs or issues please inform me so I can fix them.